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BIOLOGICAL NOTES ON DIPTERA, (Article 3d.)

BY R. OSTEN SACKEN.

1. A *Cecidomyia*, living in pine-resin (*Diplosis resinicola*, n. sp.)

On the 28th of May, 1871, being in Tarrytown, N. Y., I noticed some lumps of semi-liquid resin on the smaller limbs of young scrub pines (*Pinus inops*) growing in a garden on the banks of the Hudson River. These lumps where whitish, about half an inch long, or smaller. On trying to remove the resin, I noticed that it harbored a number of reddish maggots; some specimens containing two or three only, others as many as twenty. The maggots had the color of the larvæ of *Cecidomyia*, but, in some other respects they were different. No lateral spiracles were apparent, but, in their stead, a pair, of horny, approximate dentate tubes at the anal end of the body, not unlike the respiratory tubes of the larvæ of *Syrphus*. The breastbone, usually distinctive of the larvæ of *Cecidomyia*, was not apparent. The manner of extending and contracting the body, especially the front part, also reminded one of *Syrphus*. When, after having been disturbed by me, they were left alone for some time, they again buried themselves in the resin, their respiratory tubes alone appearing on the surface of the lump. By counting these, under a magnifying glass, one could easily ascertain the number of the hidden larvæ. After having brought them home, I noticed after a few days that the larvæ had gradually contracted towards the inside of the lump, each however remaining connected with the open air by a tubular passage of apparently hardened resin. Both these tubes and the reddish larvæ at their inner end were visible through the semi-transparent resin.

It was evident that the larvæ were undergoing transformation. A few days more, and the reddish color of the pupæ became blackened, and on the 11th of June the flies escaped. The process was as follows: the pupa, by gentle contractions and expansions of the abdominal segments gradually pushed itself along its tube towards the surface of the lump, until its thorax projected out of the resin; then the thorax split open and the fly emerged in the usual manner; the pupa-case remained behind, sticking out of the resin. The pupa is quite smooth without any horny projections on its front part. I obtained about twenty flies from a single lump, which, after their escape, looked quite honeycombed by the now empty, vermicular tubes.

Diplosis resinicola, n. sp.—Length 0.12—0.14 of an inch. *Male* antennæ not much shorter than the body, of dark color, except the scapus, which is reddish; 2x24 jointed, flagellum with small, subglobular joints alternating with double, subcylindrical ones; pedicels between the joints about equal to the diameter of the shorter joints, somewhat longer towards the end of the antennæ, joints verticillate, the length of the hairs of the verticils not exceeding the length of joints. *Female* antennæ less than half as long as the body, 2x12 jointed; joints of flagellum subcylindrical, more than twice longer than they are broad, the basal ones being the longest; pedicels short: the hairs, clothing the antennæ, are shorter than each single joint. Head strongly gibbous above, which gibbosity is very striking, when viewed in front or from the side; the black eyes being absolutely confluent, and covering the whole gibbosity, occupy nearly the whole surface of the head, except a small space round and below the antennæ and a portion of the occiput, which are brownish red (the brown predominating in several specimens). The ground color of thorax is reddish; the dorsal portion however, including the scutellum, are grayish brown; rows of yellowish hairs indicate the direction of the ordinary stripes (when rubbed off these hairs show gray stripes under them); the middle stripe is divided in two by a grayish longitudinal line; pleuræ and sternum reddish, mixed with brownish gray; abdomen reddish, with grayish-yellow hairs, long and erect along the sides, short and appressed on the back; genitals pale. Feet brownish, with a yellowish-gray, appressed pubescence; some longer hairs on the underside of the femora halteres; with dark knobs. Wings gray, second longitudinal vein arcuated in its latter portion, ending immediately beyond the apex of the wing.

Described from 4 ♂, and 7 ♀, specimens, before they were dry.

The extraordinary shape of the head will render the recognition of this species easy.

Observation.—The antennæ of this species, in both sexes, are exactly similar to the pair of antennæ figured by Winnertz in *Linn. Entom. VIII*, tab. *III*, fig. 7, a. b. Now these figures represent the antennæ of *Diplosis pini*, Degeer, a species which forms a cocoon of resin on pine leaves, (An American species, called by me *Cec. pini inopis*, has exactly the same habit; compare monographs of N. A. Diptera, Vol. I, p. 196). But, beyond this resemblance of the antennæ, the perfect insects in both species are very distinct, as well as the larvæ and the pupæ. (The larvæ of *D. pini*, it may be remembered, has two rows of peculiar fleshy tubercles along the back.)

2. A gall of *Cecidomyia*, on the wild cherry, (*Cecidomyia cerasi serotinæ*, n. sp.

The terminal buds of young shoots of the wild cherry (*Cerasus serotina*), are enlarged, sometimes to the size of a cherry; the gall is red, more or less rounded; one or two leaves issue from its sides; surface more or less even, except the apex, which is irregular, showing the tips of deformed leaves. The whole appearance of the gall is not unlike that of a ripe rose-apple (seed of a rose). The consistency of the gall, when young, is fleshy; the cavity on the inside occupies about one half of the diameter of the gall; it is filled with bright-yellow larvæ, which have the power of leaping by the contraction of their bodies. Found in Tarrytown, May 28 1871.

3. *Additions and Corrections.*

As related by me in the *Trans. Am. Ent. Soc.* 1869, p. 299. I bred *Asphondylia monacha*, O.S. from *Solidago-galls* in September and October. Since then, I caught a *male* specimen of this insect on the 17th of June 1871, near Tarrytown, N. Y., on what was apparently a young shoot of *Solidago*. That the insect should reappear in the early summer in order to lay its eggs on that plant, thus giving rise to the growth of the future gall, is very natural. But the question remains to be solved, what becomes of it between September and June? The specimen caught by me was perfectly fresh and did not look rubbed and battered, as insects which are covered with scales and delicate decidous hairs usually do after hybernating. Did it belong to a second brood? And if it did, where does this brood develop? Almost every gall suggests similar questions as to the mode of existence of the gall-producing insect during the greater part of the year; but in most cases, *Cecidomyiæ*, on account of the uniformity of their coloring, hardly attract any notice, except in connection with galls. The coloring of *A. monacha* however is so striking, that it affords a very good oportunity for observations of this kind.

This summer (June, 1871) at Tarrytown, N. Y., I have again observed the enlarged buds of *Sambucus racemosa*, containing larvæ of *Cecidomyia sambuci umbellicola* (compare these Transactions, Vol. III, p. 52.) The buds fall to the ground very easily, where, I suppose, the transformation of the fly takes place.

In the same paper (Trans. Am. Ent. Soc. Vol. III, p. 53), *Cecid-quercus majulis*, should read *C. q. majalis.*